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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/027,667      | 12/21/2001  | Mario Elmen Tremblay | 8828                | 1150             |

27752 7590 08/13/2004

THE PROCTER & GAMBLE COMPANY  
INTELLECTUAL PROPERTY DIVISION  
WINTON HILL TECHNICAL CENTER - BOX 161  
6110 CENTER HILL AVENUE  
CINCINNATI, OH 45224

EXAMINER

WILKINS III, HARRY D

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1742

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                                  |                                 |  |
|------------------------------|----------------------------------|---------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/027,667    | Applicant(s)<br>TREMBLAY ET AL. |  |
|                              | Examiner<br>Harry D Wilkins, III | Art Unit<br>1742                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-93 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-93 is/are rejected.
- 7) ☒ Claim(s) 28,59 and 90 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. All previous grounds of rejection have been withdrawn in view of either and/or both Applicant's remarks and claim amendments.
2. However, new grounds of rejection are presented below.

#### ***Claim Objections***

3. Claims 28, 59 and 90 are objected to because of the following informalities: these claims recite "the porous anode" which does not have proper antecedent basis except in the previous claim, not the independent claim. Appropriate correction is required. Claim 28 should depend from claim 27, claim 59 should depend from claim 58 and claim 90 should depend from claim 89.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Kelley (US 6,306,281).

Kelley anticipates the claimed invention. Kelley teaches (see figure and abstract) an apparatus for electrolyzing an electrolytic solution including a non-membrane (barrier) cell including an anode and cathode defining a passage formed there between,

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an inlet port, an outlet port and a D current supply (not shown in figure, see col. 2, lines 65-67) that supplies 3-12 volts that uses (as per Examples 1-11) less than 5 amps of current.

Regarding claim 3, the apparatus further includes a pump for moving electrolytic solution (figure 1).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 4, 22, 23, 32, 34, 35, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley (US 6,306,281).

The teachings of Kelley are described above.

Kelley does not teach the anode surface area is less than 30cm<sup>2</sup>.

However, changes in size absent a showing of unexpected results have been held to be mere routine experimentation and within the skill of a routineer in the art.

See MPEP 2144.04.IV.A. Therefore, it would have been obvious to one of ordinary skill in the art to have made the electrolytic cell of Kelley small enough to have a anode surface area of less than 30 cm<sup>2</sup> as claimed in order to adjust the total output of the electrolytic cell to the desired amount.

Regarding claims 4 and 35, it would have been obvious to one of ordinary skill in the art to have recirculated the electrolytic solution because recycling is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to recycle fluid through a "reactor" to increase yield). Changing economic considerations do not make obvious expedient into unobvious improvement. *Ex parte Fuller*, 172 USPQ 317.

Regarding claims 22, 23, 53 and 54, it would have been obvious to one of ordinary skill in the art to have added a water sensor for automatically turning the electrolytic cell on and off because such automatic switch is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to add an automatic on/off control to prevent wasting power when water is not available and to remove any manual activity in the process).

9. Claims 63, 65, 66, 84 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley (US 6,306,281) in view of Spence (US 4,414,070).

The teachings of Kelley are described above.

Kelley does not teach the anode-cathode gap distance is less than 0.6 mm.

Spence teaches (see col. 1, lines 24-29) that the efficiency of electrolytic cells is dependent upon the anode-cathode distance, and that as the distance decreases, the efficiency increases.

Therefore, it would have been within the expected skill of a routineer in the art to have modified the apparatus of Kelley to use as small an anode-cathode gap as possible, such as less than 0.6 mm as claimed because Spence teaches that decreased anode-cathode gap improves efficiency.

Regarding claim 65, the apparatus of Kelley further includes a pump for moving electrolytic solution (figure 1).

Regarding claim 66, it would have been obvious to one of ordinary skill in the art to have recirculated the electrolytic solution because recycling is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to recycle fluid through a "reactor" to increase yield). Changing economic considerations do not make obvious expedient into unobvious improvement. *Ex parte Fuller*, 172 USPQ 317.

Regarding claims 84 and 85, it would have been obvious to one of ordinary skill in the art to have added a water sensor for automatically turning the electrolytic cell on and off because such automatic switch is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to add an automatic on/off control to prevent wasting power when water is not available and to remove any manual activity in the process).

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10. Claims 1-4, 22-24, 29-31, 32-35, 53-55 and 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herrington et al (US 6,261,464).

Herrington et al teach an apparatus for electrolyzing an electrolytic solution comprising:

(a) a non-barrier electrolytic cell comprising:

(1) an anode (col. 5, line 54);

(2) a cathode, said anode and cathode defining a "cell volume" formed therebetween (cathode at Fig. 1 (106) and passage is between 106 and anode as outer electrode;.

(3) a port (for example Fig. 4, 146) communicating with the cell volume used to both receive a flow of electrolytic solution and also for providing an exit for the flow of electrolytic solution having been electrolyzed; and,

(b) a direct current supply providing an electrical current from said anode to said cathode, wherein said current supply delivers less than about 5 watts of power, wherein the electrical current electrolyzes the electrolytic solution (Fig. 1, 102).

The difference between the apparatus of Herrington et al and the present invention is that the present invention is a continuous-process apparatus for performing the same function as the prior art batch-process apparatus of Herrington et al.

However, it has been held that it is within the ordinary skill in the art to adapt a batch-type process/apparatus to be used in a continuous process/apparatus. Please see MPEP 2144.04.V.E. In order to operate the apparatus of Herrington et al in a continuous manner, one of ordinary skill in the art would have added a second (outlet)

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port for discharging solution so that the solution may be fed continuously through the first (inlet) port.

Regarding claims 2, 24, 29-31, 33, 55 and 60-62, Herrington et al teach that the apparatus comprises a body which contains the electrolytic cell and power supply (Fig. 1, 108), a current supply such as a battery or a solar cell (col. 8, lines 1-5); a travel water purification device (i.e.-"portable"; Abstract); is adapted to remove impurities (Abstract); and is adapted to kill microorganisms (col. 4, lines 18-25).

Regarding claim 3 and 34, as part of making the apparatus continuous, one of ordinary skill in the art would have added means, such as a pump or other motive device, to cause the electrolyte to flow through the electrolytic cell.

Regarding claims 4 and 35, it would have been obvious to one of ordinary skill in the art to have recirculated the electrolytic solution because recycling is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to recycle fluid through a "reactor" to increase yield). Changing economic considerations do not make obvious expedient into unobvious improvement. *Ex parte Fuller*, 172 USPQ 317.

Regarding claims 22, 23, 53 and 54, it would have been obvious to one of ordinary skill in the art to have added a water sensor for automatically turning the electrolytic cell on and off because such automatic switch is an obvious engineering design improvement that comes from efficiency and economic design considerations (i.e.-it is within routine skill in the art to add an automatic on/off control to prevent



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wasting power when water is not available and to remove any manual activity in the process).

Regarding claims 32, while Herrington et al fail to expressly disclose the anode surface area, it would have been considered to inherently be less than about 30 cm<sup>2</sup> because Herrington et al is described as a portable water disinfection system which is the size of a pen. One of ordinary skill in the art would have recognized an electrode surface area which can fit in a chamber the size of a pen would be less than 30 cm<sup>2</sup> in size.

11. Claims 5-21 and 36-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herrington et al (US 6,261,464) as applied to claims 1-4, 22-24, 29-31, 32-35, 53-55 and 60-62 above, and further in view of Weakly et al (US 2002/0157966).

Herrington et al does not teach a filter such as activated carbon or resin which can filter out harmless materials.

Weakly et al teach (see paragraphs 35 and 49) a specific filter such as activated carbon or resin which can filter out arsenic.

Therefore, it would have been obvious to one of ordinary skill in the art to have modified the apparatus of Herrington et al to include the filter material of Weakly et al because Weakly et al teach that the filter removes arsenic from the treated water which would have minimized contaminants for the end user of the treated water of the process of Herrington et al.

It should be noted that the specific rate or degree of filtration is a method limitation which does nothing to further define the structure in apparatus claims. The apparatus must merely be capable of operating at the specific operating conditions which appears to be the case with the apparatus of Weakly et al. The specific filtration properties would have been considered a result effective variable by one having ordinary skill in the art. As such, one having ordinary skill would have routinely optimized the pressure of the chamber to obtain the purification attendant therewith. *In re Boesch* and *In re Aller*.

12. Claims 25-26 and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herrington et al (US 6,261,464) as applied to claims 1-4, 22-24, 29-31, 32-35, 53-55 and 60-62 above, and further in view of Beer (US 3,632,498).

The teachings of Herrington et al are described above.

However, Herrington et al do not teach that the electrode is a foil electrode comprising a group VIII metal.

Beer teaches (see abstract and claims 1 and 3) a composite electrode including a conductive base with a foil of an active material such as palladium, platinum, rhodium, iridium, ruthenium or osmium (group VIII metals) on the surface. Beer teaches that this electrode is useful in processes including purification of water and has a long life, low overvoltage and catalytic properties.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the composite electrode of Beer for the anode of Herrington et al because the

electrode of Beer is useful in water purification and has a long life, low overvoltage and catalytic properties.

13. Claims 27-28 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herrington et al (US 6,261,464) as applied to claims 1-4, 22-24, 29-31, 32-35, 53-55 and 60-62 above, and further in view of Graham et al (US 5,937,641).

The teachings of Herrington et al are described above.

However, Herrington et al do not teach that the electrode is a foil electrode comprising a group VIII metal.

Graham et al teach (see col. 8, lines 1-23) a porous metallic foam useful in a catalytic converter. The porous foam is capable of withstanding high temperatures and vibrations.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the porous material of Graham et al for the anode of Herrington et al because the porous material of Beer resist vibrations and also provides a high surface contact area for electrolytic reaction.

14. Claims 63-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herrington et al or Herrington et al in view of Weakly et al or Herrington et al in view of Beer or Herrington et al in view of Graham et al as applied to claims 1-62 above, and further in view of Spence (US 4,414,070).

The teachings of Herrington et al, Weakly et al, Beer and Graham et al are described above.

However, the teachings of Herrington et al fail to teach the anode-cathode distance of the electrolytic cell.

Spence teaches (see col. 1, lines 24-29) that the efficiency of electrolytic cells is dependent upon the anode-cathode distance, and that as the distance decreases, the efficiency increases.

Therefore, it would have been within the expected skill of a routineer in the art to have modified the apparatus of Herrington et al to use as small an anode-cathode gap as possible, such as less than 0.6 mm as claimed because Spence teaches that decreased anode-cathode gap improves efficiency.

Regarding claims 64-93, see above regarding corresponding claims 2-31 or 33-62.

### ***Response to Arguments***

15. Applicant's arguments with respect to claims 1-93 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10:30am-9:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

ROY KING *R*  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700